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WILTON L. HALVERSON, M.D.
DIRECTOR OF PUBLIC HEALTH

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BLOOD GROUPS AND TYPES AND THEIR RELATION TO BLOOD TRANSFUSIONS

By MALCOLM H. MERRILL, M.D., Chief, Division of Laboratories

The value of human blood and human plasma as therapeutic agents was dramatically demonstrated in the recent world war. Millions of people donated blood to the American Red Cross for use in the treatment of battle casualties with results so effective that many have asked if blood might now be made more available in civilian life than in the past.

In answer to the question some State Health Departments have already initiated state-wide human plasma and blood-bank programs. In California the problem received considerable attention during the past year. In its last regular session the State Legislature, recognizing the possible importance of plasma and blood banks to the health of the people of California, by concurrent resolution instructed the State Department of Public Health to conduct a thorough study of the problem and report its findings and recommendations at the next session.

Current knowledge of fundamental facts concerning the immunological properties of human blood is here summarized. Readers desiring more detailed information are referred to the excellent reviews noted in the bibliography.

Variations in the antigen and antibody composition of human blood are among the most interesting biological phenomena. They open up vast fields for study in anthropology and heredity; they offer practical solutions to many medico-legal problems involving parentage; they pose concrete problems in the use of human blood for transfusions and in the use of human plasma and serum. Recently expanded knowledge concerning these variations has clarified the etiology of long recognized pathological conditions—particularly that known as erythroblastosis fetalis—end of hitherto unexplained transfusion reactions.

Primary attention is here devoted to a consideration of the basic information concerning the blood groups and types, and the application of this information to the use of human blood in transfusions.

HISTORY OF THE THERAPEUTIC USE OF HUMAN WHOLE BLOOD AND PLASMA AND SERUM *

The first blood transfusion of which there is authentic record was that performed by Richard Lower in England in 1665. This consisted in the transfusion of blood from dog to dog. Previously—in 1615—Lebavius, also in England, described a transfusion procedure but there is no evidence that he actually tried out his technic.

The first recorded transfusion in human beings was performed in 1667 by Denys and Emmery, when nine ounces of blood from the carotid artery of a lamb were transfused with success into the vein of a young man. Denys records that the patient passed urine as black as soot following the transfusion. Later experiments terminated with the death of the fourth patient transfused by Denys. There followed extensive legal proceedings against him in the French courts. And finally an edict of the French Parliament specifically prohibiting transfusions closed further experimental work for 150 years.

* Most of the data on the history of blood transfusions comes from A. S. Weiner.

In 1818 interest in transfusion was revived by the research of James Blundell, who developed a crude technic of syringe transfusion.

In 1913 Ottenberg and Kaliski reported observations on 128 human blood transfusions.

Before the present state of perfection could be achieved, two main difficulties had to be overcome. First, the difficulties caused by coagulation of the blood had to be prevented. This phase was mastered by perfecting the transfusion apparatus and technic. Second, unfavorable reactions to transfusion caused by "incompatibility" of the bloods of the donor and recipient had to be recognized and resolved. This difficulty has now been almost overcome as a result of significant information obtained in the past three years.

The real impetus to improving transfusion technics was given by the first world war. The initial technic was artery to vein anastomasis, later tube connection, next syringe, then the paraffined bottle to prevent clotting. Citrated blood was first used in 1914, an indirect technic which has now replaced all others.

Our present knowledge of blood groups is based on comparatively recent contributions. In 1900 isohemagglutinins in human blood were discovered by Landsteiner, who recognized three groups (A, B, and O). In 1902 the fourth and rarest group (AB) was discovered by von Decastello and Sturli. Schultz in 1910 and Ottenberg in 1911 were probably the first to apply this information in human transfusions. In 1911 the existence of subdivisions in two of the four groups was discovered by von Dungern and Hirsfeld.

In 1927 three additional properties were discovered in human blood by Landsteiner and Levine and designated by them as M, N, and P.

The discovery of the Rh factor was reported by Landsteiner and Weiner in 1940, and with the aid of extensive data developed during the past five years, the intricacies of this factor are being worked out. Also since 1940 the Hr factors have been described. We know that there are probably 12 antigenic factors and that they may produce at least 576—perhaps as many as 1728—separate combinations or distinct types of human blood.

THE LANDSTEINER BLOOD GROUPS

The four human blood groups discovered in 1900 and 1902 are known as the Landsteiner blood groups. Their existence is dependent upon the occurrence of two basic antigens—agglutinogens designated as A and B, and their corresponding antibodies—agglutinins alpha (*a*) and beta (*b*). When neither antigen is present, the person belongs to Group O.

In the groups noted above there have been found subgroups of A agglutinogen and *a* agglutinin which are closely related immunologically. The subgroups are designated A_1, A_2, and A_3.

There is growing evidence of significant variation in the percentage occurrence of the four groups among the different races. The highest incidence of Group O appears to occur in Negroes (45.8 per cent); the lowest among the Chinese (31.2 per cent).

THE AGGLUTINOGENS M AND N

It has been mentioned that two factors—M and N—were demonstrated in 1927. One or both of them appear always to be present in human blood. Landsteiner and Levine found that according to whether the blood contains the agglutinogens M and N, separate or in combination, three distinct types of human blood—M, N, and MN—can be distinguished; and each type contains the corresponding agglutinogen or in the latter case both of them.

The distribution of the three types is the same in each of the four Landsteiner blood groups. Thus the agglutinogens M and N are unrelated to the agglutinogens A and B.

Significant biological difference exists between the M and N agglutinogens and the A and B agglutinogens. In the case of a Landsteiner group, if the agglutinogen is not present in the red blood cells, the corresponding agglutinin is present in the serum. But this is not true in the case of M and N agglutinogens. Weiner records that among hundreds of thousands of human sera tested, anti-M agglutinins have been found in only seven instances and anti-N agglutinins in none. Furthermore, since anti-M isoantibodies have been observed in only two post transfusion sera and anti-N agglutinins have never been found in human sera, agglutinogens M and N are apparently very poor antigens in man. It would appear that N agglutinogen is not antigenic in man and can therefore be disregarded as a factor in causing transfusion reactions. But M agglutinogen must be taken into consideration in analyzing transfusion reactions because it was shown to be antigenic though in rare cases only.

The per cent of occurrences in the three types in the white race has been found by Weiner, Sonn, and Belkins to be as follows:

M—29.2%
N—21.2%
MN—49.6%

There is evidence of some degree of difference in percentage distribution of the three types among different races.

P AGGLUTINOGEN

In connection with their studies in the differentiation of M and N agglutinogens, Landsteiner and Levine in

1928 found still another property in human blood which they designated as agglutinogen P. This has been found to be present in about 73.2 per cent of 328 white individuals tested.

Weiner finds that isoantibodies against P occur occasionally in normal human sera. Anti-P agglutins also occur rarely as a result of isoimmunization in patients receiving repeated blood transfusions. While the possibility thus exists that this factor could on rare occasions give rise to hemolytic transfusion reactions, no such reaction appears to have been reported. From present information, therefore, this factor need not be considered in the routine of blood transfusions or operation of blood banks.

As in the case of other factors, there is evidence of racial differences in the frequency of occurrence of the P factor.

THE Rh FACTORS

General Considerations

The entire development of our knowledge relative to the Rh factors in human blood is a product of the past seven years. In 1937, while studying the properties M and N of human blood, Landsteiner and Weiner demonstrated the presence of M-like agglutinogens in the blood of anthropoid apes and old-world monkeys. By immunizing rabbits with the blood of rhesus monkeys, potent anti-M immune sera was obtained. This led to the idea that in the same way it might be possible to produce antibodies against hitherto undiscovered individual blood factors in human blood. Through further study it was possible to produce antisera which reacted with the bloods of approximately 85 per cent of all white individuals, independently of the blood groups. This property proved to be different from A, B, M, N, and P, and was named Rh to indicate the manner in which it was discovered.

Until recently it was generally believed that no dangerous transfusion reactions could occur if patient and donor belonged to the same Landsteiner blood group, and indeed almost all hemolytic reactions could be traced to errors in blood grouping of patient or donor. However, during the decade 1930-1939 with the increasing use of blood transfusions, authenticated reports began to appear of hemolytic reactions despite the use of blood of the correct blood group. In most of these cases no explanation could be found; but in a few instances, the patient's serum was reported to contain irregular isoagglutinins or isohemolysins that acted on the blood of the donor used for the transfusion as well as on certain other human bloods, despite the fact they were of the correct Landsteiner blood groups.

Some time after the Rh factor was discovered, Weiner and Peters reported three hemolytic transfusion reactions, one fatal, due to isoimmunization against this new blood property.* The patients, all Rh-negative—bloods devoid of Rh agglutinogen—had been given repeated transfusions of blood of the homologous Landsteiner blood group; but the donors' bloods were Rh-positive—contained the Rh agglutinogen or antigen. This was the first clear demonstration that patients could be sensitized to the Rh factor and that reactions would occur upon repetition of transfusions. Such reactions were at first mild, then progressively more severe, until finally a dangerous hemolytic reaction directed attention to the true nature of the phenomenon. First, the Rh factor was antigenic in man; second, repeated contact appeared necessary in order to build up a high degree of sensitivity; third, the phenomenon was entirely unrelated to previously known blood antigenic factors.

Within a year, Weiner encountered 10 additional examples of reactions caused by isoimmunization against the Rh factor, the indication being that such isoimmunization must be the usual explanation for hemolytic reactions when blood of the correct Landsteiner group is transfused. According to Weiner it is estimated that approximately 90 per cent of intragroup hemolytic reactions are due to the Rh factor.

Analysis of intragroup transfusion reactions by Weiner revealed that these fall into two groups: (1) instances in which the Rh-negative patient has been given repeated blood transfusions and as a result has become sensitized to the Rh factor, and (2) intragroup hemolytic reactions occurring after an initial transfusion. In the latter group it was observed that the patients had all been pregnant recently, and this suggested that the fetus in utero was the source of the antigen which had sensitized the patient. Since it was further noticed that in many instances where the patients had had hemolytic reactions, their infants were stillborn or had erythroblastosis, the solution to a second medical mystery was suggested. Landsteiner and Weiner showed that if an Rh-negative woman has an Rh-positive husband, the fetus in utero may inherit the Rh factor from its father and be Rh-positive.

An Rh-negative woman may thus become sensitized to the Rh-factor, so that if she is given a transfusion of Rh-positive blood, a dangerous hemolytic reaction could result. Moreover, in addition to sensitizing the mother, the Rh isoantibodies produced by the mother could pass through the placenta into the fetus and destroy its red blood cells, giving rise to one or another of the manifestations of erythroblastosis fetalis.

* Elmer L. DeGowin (Science 102-234 August 31, 1945) has recently suggested the use of the term "isosensitization" instead of "isoimmunization" claiming that the former is more descriptive of what actually happens. He suggests substitution of the word "isosensitivity" for "isoimmunity" for the state of vulnerability caused by the development of antibodies.

The question arises as to why such transfusion reactions and occurrence of erythroblastosis are not more frequent if 15 per cent of the white population is Rh-negative. As a matter of fact, instances of intragroup hemolytic reactions and erythroblastotic infants are rather uncommon. While one out of every seven individuals is Rh-negative, not every Rh-negative individual becomes sensitized to the Rh factor when transfused with Rh-positive blood or when pregnant with an Rh-positive fetus. Weiner points out that among Rh-negative individuals there are wide differences in the ease with which they can be sensitized so that only about one in fifty is readily sensitized. Since the remainder might require as many as 10 to 20 or more transfusions or multiple pregnancies before sensitization occurred, under ordinary conditions no isoimmunization would result. This extreme variability in the susceptibility to sensitization has led to rather extensive efforts to devise tests for determining sensitivity.

By test-tube agglutination tests with technics employed until the last year, positive tests were obtained in only about 50 per cent of sensitized persons. With recent refinement in technic, however, it now appears possible to recognize sensitivity in over 99 per cent of the sensitized patients.

This finding is of significant practical importance because it enables a physician to determine the sensitivity level of a patient, and it is of prognostic value particularly in pregnancy involving Rh-negative mothers with Rh-positive husbands.

Classification of the Rh Blood Types

Anti-Rh sera have been obtained from two primary sources: from guinea pigs immunized with the blood of rhesus monkeys, and from Rh-negative patients who have had hemolytic reactions or borne infants with hemolytic disease. Guinea pig serum has the advantage that it can be produced at will if rhesus monkeys are available. Disadvantages are that more technical skill is required for its use in accurate tests, that it can not be used in typing infants' bloods as it strongly agglutinates the blood of all infants regardless of Rh type, and finally it does not differentiate the various Rh types. Human anti-Rh sera on the other hand are simpler to use and possess varying specificities. With the aid of human anti-Rh sera, it has been discovered that there are three antigenic factors involved which have been designated Rh_0, Rh', and Rh''. These may be completely absent—Rh-negative bloods—or may occur in all possible combinations, thereby giving rise to eight types of human blood. The percentage distribution of the various factors is shown in the accompanying table.

OCCURRENCE OF BLOOD GROUPS, TYPES ISO ANTIGENS AND ISO ANTIBODIES IN THE WHITE POPULATION
(Data After Wiener)

Group or type	Per cent occurrence	Antigens present	Antibodies present	
			Natural	Acquired by immunization
O	45		ab	
A	41	A	b	(May be abnormal increase in titer through immunization)
B	10	B	a	
AB	4	AB		
M	29	M		
N	21	N	m (rare)	m (Several reported instances)
MN	50	MN		
P+	73	P		
P−	27		p (rare)	p (Reported in few cases)
Rh Neg.	12.9	**		Anti Rh_0, Rh' or Rh.''
Rh'	0.9	Rh'		Anti Rh_0 or Rh''
Rh''	0.3	Rh''		Anti Rh_0 or Rh'
*Rh' Rh''	0.0	Rh' Rh''		Anti Rh_0
Rh_0	2.6	Rh_0		Anti Rh' or Rh''
Rh_1 (Rh'$_0$)	54.1	Rh_0 Rh'		Anti Rh''
Rh_2 (Rh''$_0$)	12.8	Rh_0 Rh''		Anti Rh'
Rh_1 Rh_2 (Rh'$_0$ Rh''$_0$)	16.4	Rh_0Rh'Rh''		

* Predicted but not yet encountered.
** As noted in the text there is now evidence that whenever one or more of the Rh factors are absent, the corresponding Hr factor is present; e.g., in Rh negative individuals Hr_0Hr' and Hr'' antigenic factors would be present.

Unlike anti-A and anti-B agglutinins, anti-Rh agglutinins are not normally present in the body; when demonstrated, they have been passively transmitted—by transfusion or from mother to fetus in utero—or have resulted from the antigenic action of introduced foreign cells. Potter has stated that antibodies against Rh-positive cells can not develop in a person with Rh-positive blood, and Rh-anti-bodies are never present in such persons except in those rare instances in which an infant with Rh-positive blood has agglutinins transferred to it through the placenta.

In the light of the discovery of three distinct antigenic factors, however, Weiner has indicated that antibodies may be induced against any one or more of the antigenic factors that are missing in a subject's blood. In this sense Rh-positive refers to the presence of any one of the Rh factors and a person can thus be Rh-positive to one or two factors and negative to the factors not present. Potter further points out that free Rh-positive cells may be found in the circulation of a person with Rh-negative blood after the transfusion of Rh-positive blood. Because of this phenomenon a person with Rh-negative blood may be incorrectly classified as having Rh-positive blood immediately after transfusion.

It has already been pointed out that there exists a wide variation in susceptibility to sensitization to Rh antigens. This variation involves both the quantity of Rh-positive blood necessary to sensitize and the time required. Coupled with this is a rather wide variation in the quantity and apparently in the inherent anti-

genicity of the Rh antigens in the blood cells of different people.

The concentration of Rh agglutinins in the blood is rarely high, usually the titer being of the order of 1:4 to 1:8; yet a titer as high as 1:5000, found six days after the termination of pregnancy, has been recorded. However, extreme variations in technic from laboratory to laboratory make accurate comparison difficult.

While the agglutinin titer may fall rather rapidly after the antigenic stimulus is withdrawn, the sensitization may persist for prolonged periods—probable for life, a fact which has only recently been recognized.

A study of the Rh agglutinin titer during pregnancy may prove to be of value to the clinician in determining the probable outcome and as a guide in deciding whether or not early termination of pregnancy is indicated.

A significant difference in the percentage distribution of the Rh factors occurs among the different races. The highest per cent (12.9) of Rh-negatives has been found in the white race, the lowest in the Chinese (0 to 1.5). There is also considerable variation in the distribution of the various Rh factors and their combinations.

THE Hr FACTOR

After the discovery of the Rh factors, it was presumed that the blood cells of Rh-negative persons were free of any antigens of this series. However, in 1943 Levin found that the serum of an Rh positive mother of an erythroblastotic infant agglutinated all Rh-negative bloods and those Rh-positive bloods which did not react with anti-Rh' serum. The symbol Hr was selected to indicate that the factor in question was opposite to Rh because of its presence in all Rh-negative bloods.

Evidence just published (Weiner, Science Nov. 9, 1945) seems to indicate there is a reciprocal relationship between Rh and Hr. Whenever any one or more of the three Rh factors are absent, it now appears that the corresponding Hr factor or factors are preesnt.

Weiner suggests that a complete transfusion service should include a panel of Hr-negative donors as well as Rh-negative donors. When a type Rh_1 patient has an intragroup hemolytic reaction, and incompatibility to factors such as M or P can be excluded, Weiner states that a test for Hr factor would be worth trying.

APPLICATION OF KNOWLEDGE CONCERNING BLOOD GROUPS AND TYPES OF BLOOD TRANSFUSIONS

The major problems relative to the selection of donors for blood transfusions still revolve around the blood groups of Landsteiner. Serious reactions are relatively infrequent when correct cross matching for these groups is carried out. The most widely accepted technic is still the use of group specific blood. However, as originally pointed out by Ottenberg, the introduction of cells that are agglutinated (or lysed) by the recipient's serum constitutes the chief danger. The donor's serum is so diluted by the recipient's blood that only when the agglutinin titer of the donor is high does it constitute a real danger. That the danger exists has recently been re-emphasized by the report of Alberton of a case of fatal hemolytic reaction following the transfusion of 100 cc of incompatible plasma saline mixture. It was found that this plasma had anti-A agglutinins active in a dilution of 1:2048. The patient had a group A cells of average sensitivity. This potential danger led to inclusion in the Sanitary Code of New York State the requirement that only those Group O individuals may be used as universal donors whose isoagglutinins have been proved by actual titration to be of low titer.

During the recent World War many thousands of transfusions using Group O blood only were given all over the world with a post transfusion reaction rate said to be just as low as the rate in the military hospitals using only cross matched blood (personal communication from Dr. John Alsever, American Red Cross).

From a practical standpoint, as already indicated, the M, N, and P factors can be disregarded in providing a transfusion service since they appear to be so rarely involved in causing transfusion reactions.

However, the problem is quite different with the Rh factors and to a lesser degree with the Hr factors. The reasons are probably two-fold why reactions have occurred so infrequently in the armed services with the use of Group O blood without regard to the Rh type. Intrauterine sensitization was ruled out by the fact that the transfusions were given to male patients; and second, most of the transfusions were given young individuals who had never before been transfused.

With the growing use of transfusions the problem presented by possible Rh sensitization becomes more serious. There is a growing sentiment for limiting to Rh-negative blood the transfusion of Rh-negative patients. Young and Kariher in a recent report have concluded that routine cross matching of a donor's cells with the recipient's serum for demonstrating acquired isoagglutinins is inadequate. In almost 1,000 transfusions in their service since November, 1943, there has been no evidence of a single reaction from intragroup incompatibility. However, there have been five hemolytic reactions, all due to acquired sensitivity to the Rh factor. They report that inability to predict intragroup reactions is due to the fact that many times the acquired Rh antibody is not demonstrable by vitro tests. This condition may be somewhat modified now, however, by the refined technics for determining sensitivity.

If these occasional serious reactions are to be prevented, there is increasing evidence that blood banks

and transfusion services will have to be organized to provide a complete grouping and typing service. Developments of the past five years seem to require the application of refined technics incident to the full determination of blood groups and types insofar as the Landsteiner groups and Rh types are concerned. Clarification of problems related to the causation of transfusion reactions has made possible a scientific approach that largely eliminates former hazards incident to the use of the human blood for transfusions.

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INSTITUTES ON SCHOOL HEALTH SET FOR MARCH AND APRIL

A series of six institutes on school health problems will be held during March and April under the joint sponsorship of the State Departments of Public Health and Education. Participants will include Dr. Dorothy B. Nyswander, author of *Solving School Health Problems*, and other leaders in the school and public health fields.

Schedule for the institutes is as follows: Oakland, March 18, 19, 20; Sacramento, March 21, 22, 23; Fresno, March 25, 26, 27; Santa Barbara, March 28, 29, 30; Los Angeles, April 1, 2, 3; San Bernardino, April 4, 5, 6.

Among the subjects which will be presented are: Modern Concepts in School Health, Improving the Quality of School Medical Services (by discussion and demonstration), Joint Planning and Action by School and Health Departments, Contributions School and Health Departments Can Make to the School Health Program, Planning the School Health Curriculum, Protection of the Health of the School Staff.

Persons invited to attend the institutes include the following:

Health officers, medical officers, community health educators, physicians, nurses and other personnel employed by health departments in the school health program;

City and county superintendents of schools, high school and elementary school principals, supervisors of instruction, health coordinators, physicians, nurses and other personnel employed by school departments in the school health program;

Representatives of boards of education, parochial schools, faculty of medical and nursing schools and teachers colleges, health chairmen of parents and teachers associations.

SAVE-A-LIFE QUIZ

Taken from *Safety News*, January, February, 1946

1. How often do accidental injuries occur in American homes?
   a. One every 2 seconds.
   b. One every 6½ seconds.
   c. One every 13 minutes.
   d. One every 9 hours.

2. The number of children from 1 to 14 years of age killed by accidents each year is how many times greater than the number killed by infantile paralysis?
   a. Five times as great.
   b. Ten times as great.
   c. Fifteen times as great.
   d. Twenty times as great.

3. The best way to apply the brakes of your car when driving on ice or snow is:
   a. To pump them.
   b. To slam them on.
   c. To ignore the brakes and shift into reverse.
   d. To use only the hand brake.

4. The safest way to walk on an icy surface is:
   a. To take long steps.
   b. To take short steps.
   c. To walk with sort of a waltz glide.
   d. To walk as you ordinarily would.

5. The greatest single cause of fires in the home is:
   a. Cigarettes.
   b. Oily rags.
   c. Dirty and defective chimneys and flues.
   d. Matches.

6. If you have a fireplace in your home, the only safe way to use it is:
   a. For toasting marshmallows.
   b. To burn coal rather than wood in it.
   c. To keep a fire screen in front of it when it is burning.
   d. To install a fire extinguisher right next to it.

For answers, turn to page 88, column 1.

SALE OF PENICILLIN

In effect since December 1, 1945 is the resolution passed by the State Board of Pharmacy of California: All preparations of penicillin for internal and/or parenteral use may be sold only upon prescription of a physician, dentist, chiropodist, or veterinarian and can be refilled only upon the order of the prescriber; topical applications of penicillin excepted.

DDT IN PURE FORM HARMLESS TO MAN *

DDT, the new insect repellent, in the so-called pure form holds no danger for man but the solvents used in the preparation of DDT mists and sprays are skin irritants if there is sufficient exposure, according to the January 5 issue of *The Journal of the American Medical Association.*

In answer to a query, *The Journal* said: "Pure DDT does not cause irritation of the skin in either animals or man, nor is there definite evidence of a sensitizing effect on the skin or of production of other allergic manifestations such as asthma. However, certain solvents used in the preparation of DDT mists, sprays, and aerosols are in themselves skin irritants if there is sufficient exposure. In addition, it should be pointed out that contamination of the skin with some of these solvents may cause such symptoms as paresthesias (burning, prickling) and anesthesia (loss of feeling or sensation). The vapors of the solvents on inhalation, owing to their property of causing irritation of the mucous membranes, may cause the onset of asthmatic symptoms in a person who is asthmatic. The usually used 5 per cent DDT-95 per cent kerosene spray is a primary skin irritant because of the kerosene. Therefore one would expect a positive patch test. Individuals vary in their skin reaction to kerosene; since this is not a sensitization phenomenon but a straight irritant action, desensitization need not be considered. As a rule the kerosene or other solvent used in the DDT insecticidal spray will evaporate from the surfaces sprayed after a period of a few weeks.

NATIONAL NEGRO HEALTH WEEK

National Negro Health Week will be observed this year March 31-April 7, having for its special objective: A Healthy Home in a Healthy Community—Health Education and Health Services. Full information regarding copies of bulletins and broadcasts, the Health Week poster contest, community organization plans, and the Health Week schedule may be obtained by writing the National Negro Health Week Committee, Washington 14, D. C. This committee wishes to know as soon as possible the approximate number of Health Week publications desired.

HOSPITAL TREATMENT FOR SYPHILIS

The application for per diem subsidization of treatment of syphilis cases in county hospitals has been approved by the U. S. Public Health Service. By the first of February 11 hospitals were operating under this agreement.

* Reprint from the *American Medical Association News*, January 4, 1946.

FOOD ACT VIOLATIONS

Misbranded and adulterated candy bars shipped to California from Louisiana and Texas accounted for two large seizures by the Bureau of Food and Drug Inspections recently.

In one city 8,000 boxes, valued at $10,000, were quarantined because the label did not bear mandatory information. In another city, approximately 16,000 bars of candy were destroyed because of insect infestation. Another lot of 15,000 pounds of adulterated, infested candy which cannot be disposed of, even for hog food, was placed in quarantine.

The adjective "fancy" as used in fancy packs of dried fruit prepared for the holiday trade was found to be imaginative in one lot recalled from the market. The appearance of the fruit had been enhanced through the application of a mineral oil glaze.

PROSTITUTION ON INCREASE

That repressive measures against commercialized vice are being relaxed in a number of communities is indicated by the fact that prostitutes are being named as sources of venereal infection in an increasing number of instances in reports coming to the State Department of Public Health.

The number of prostitutes named by patients as sources of infection in three San Francisco Bay area cities increased from 29 in July to 239 in November.

At the request of public health and law officials in a valley county, a State venereal disease investigator recently cooperated with the sheriff's and district attorney's office in raiding four houses of prostitution in a city where there was evidence of lax local enforcement of the law. Evidence was based upon the fact that patients in a venereal disease clinic had named prostitutes in the four houses as sources of their infection.

Twelve prostitutes were arrested of which seven were found upon examination to be infected. Results of the medical examination came as a surprise to the city officials who were depending upon "health certificates" issued by a local physician.

NEW PAMPHLET AVAILABLE

The School Lunch, a manual for lunchroom and cafeteria managers and cooks has been issued by the Bureau of Maternal and Child Health. The manual, which has the approval of the State Department of Education, contains information on menu planning, preparation of market orders, food and kitchen sanitation and recipes for mass feeding.

ANSWERS TO SAVE-A-LIFE QUIZ

1. One every 6½ seconds.
2. Twenty times as great.
3. To pump them.
4. To take short steps.
5. Dirty and defective chimneys and flues.
6. To keep a fire screen in front of it when it is burning.

THE VIRUS LABORATORY

The International Health Division of the Rockefeller Foundation has approved a $42,000 contribution for continuing in the 1946-1947 fiscal year in virus laboratory research projects. Plans have been formulated whereby research fellows from that division may receive their training in virus work in this laboratory.

RESOLUTION FOR A NEW BASIS FOR APPORTIONING STATE SCHOOL FUNDS

Various professional groups will be interested in the resolution adopted by the Santa Barbara City Schools and already accepted elsewhere in the State:

Resolved, That immediate steps be taken to consider the best ways of changing or amending the State law which apportions funds to school districts on a average daily attendance basis to the end that children may be encouraged to secure adequate treatment of and protection from illness and may stay out of school for such treatment without loss to the school district of official attendance credit and financial support.

UNIVERSITY INSTITUTES ON TUBERCULOSIS AND VD NURSING

Arrangements for nursing instructors for the institutes on tuberculosis and venereal disease nursing have been completed by the University Summer Sessions office. Margaret Taylor, Tuberculosis Nursing Consultant with the U. S. Public Health Service, will be instructor for the tuberculosis nursing institute at the University of California in Berkeley from June 24 to July 12. Mrs. Evangeline Morris, Assistant Professor of Nursing, Simmons College, Boston, has accepted the invitation of the university to serve as nursing instructor for the institute at U. C. L. A. on the control of venereal diseases, July 15 to August 2.

You can START your car in cold weather. But can you STOP it? Ice and snow increase braking distance from three to 11 times that required on dry pavements, reminds the National Safety Council. With ice and snow on winter roads, the safe driver knows that he must keep tires, tire chains, and brakes in top condition at all times. Tire chains, it is stated, cut braking distance to half on snow or ice.

APPOINTMENTS IN THE STATE HEALTH DEPARTMENT

From his services in the Army, Dr. David D. Holaday has returned to the Department as Assistant Chief, Division of Local Health Services, with headquarters in San Francisco.

Dr. John Dement, formerly Medical Officer with the Bureau of Venereal Diseases of this Department and assistant health officer, City of Oakland, has returned from military service to the Department as Assistant Chief, Division of Local Health Services, with headquarters in Sacramento.

MORBIDITY REPORTS—SELECTED DISEASES—CIVILIAN CASES

Total Cases for December and Total Cases for January Through December 1945, 1944, 1943 and 5-Year Median (1940-1944)

Selected diseases	Current month: December				Cumulative: January through December			
	1945	1944	1943	5-yr. median, 1940-1944	1945	1944	1943	5-yr. median, 1940-1944
Chickenpox (Varicella)	1,881	2,962	3,015	3,015	43,425	35,858	44,701	35,858
Coccidioidal granuloma	4	3	3	.....	42	32	25	.....
Conjunctivitis—acute infectious of the newborn (Ophthalmia Neonatorum)	6	1	3	.....	27	37	38	.....
Diarrhea of the newborn	10	3	4	.....	57	83	166	.....
Diphtheria	140	115	140	115	1,295	1,215	1,167	892
Dysentery, bacillary	22	33	31	.....	284	473	456	.....
Encephalitis, infectious	12	6	12	.....	288	80	172	.....
Epilepsy	92	106	158	.....	1,519	1,547	1,591	.....
Food poisoning	40	39	56	.....	484	631	968	.....
German measles (Rubell)	290	280	287	.....	11,276	14,862	29,356	.....
Influenza, epidemic	655	85	11,083	358	1,380	11,136	12,565	12,565
Jaundice, infectious	25	28	20	.....	247	335	118	.....
Malaria	49	7	14	7	269	128	145	139
Measles (Rubeola)	1,302	1,051	705	705	34,002	68,382	21,134	21,134
Meningitis, meningococcic	57	53	82	25	681	989	927	207
Mumps (Parotitis)	1,851	2,468	1,942	1,942	37,178	32,585	24,427	32,496
Pneumonia, infectious	316	358	495	390	3,330	4,294	4,432	3,386
Poliomyelitis, acute anterior	71	37	99	37	892	459	2,649	446
Rabies, animal	35	46	52	46	581	909	740	531
Rheumatic fever	38	65	28	.....	735	569	342	.....
Scarlet fever	913	1,251	929	711	13,661	10,599	7,157	5,877
Smallpox (Variola)	.....	.....	.....	0	4	20	4	13
Tuberculosis:								
Pulmonary	547	646	672	646	8,032	8,434	7,467	7,247
Other forms	31	100	64	35	583	592	446	446
Typhoid fever	4	8	31	20	132	253	164	233
Typhus fever	9	5	4	.....	65	41	26	.....
Undulant fever (Brucellosis)	19	24	25	24	260	320	237	278
Whooping cough (Pertussis)	404	533	430	795	13,842	5,003	14,335	14,335
Venereal diseases:								
Chancroid	20	25	41	.....	256	309	215	.....
Gonococcus infection	2,140	1,792	1,485	1,482	27,666	20,365	14,632	16,100
Granuloma inguinale	1	2	1	.....	43	23	22	.....
Lymphogranuloma venereum	15	10	18	.....	246	228	190	.....
Syphilis	1,731	1,893	2,244	1,893	26,975	26,961	29,346	23,225

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